

SPECIFICATION AMENDMENTS

Please change the title to read as follows:

TWO-DIMENSIONAL IMAGE PICKUP ELEMENT FORMED ON A
SINGLE CHIP

Please amend Page 19 of the Specification to refer to the reference numeral
“66”, as set forth on the next succeeding page.

sectional view showing the structure of a photoelectric conversion unit, vertical CCD, and channel stop.

Fig. 9B is a sectional view showing the structure of an inverter unit that forms part of a signal processing circuit.

As shown in Fig. 9A, a unit pixel is formed from a PD region serving as a photoelectric conversion unit, a transfer gate region for transferring charges, a vertical CCD region, and a channel stop region. These regions are formed in a p-well 65 formed on an n-substrate 60. In the PD region, a dark current is reduced by a p⁺-layer 67 on the surface. In the vertical CCD region, a p-layer 68 is formed under an n-layer 69 to reduce an increase and smearing in transfer charge amount. In the transfer gate region, control is executed to transfer photocharges, which are accumulated in an area 66, from the PD to the vertical CCD. The solid-state image pickup element also has a microlens 61 for focusing light in the PD region, a light-shielding layer 62, a gate electrode 63 made of polysilicon, and an SiO₂ layer 64.

As shown in Fig. 9B, in the inverter unit as part of the signal processing circuit, a p-well and n-well are formed on the n-substrate 60 to form an NMOS transistor and PMOS transistor.

Well separation between the CCD unit and the signal processing circuit unit is preferably done from the charge detection circuit unit. This is because the